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CATHEDRAL OF S. FIN BARRE, CORK.

MR. J. BURGES, Architect.

Frontispiece.

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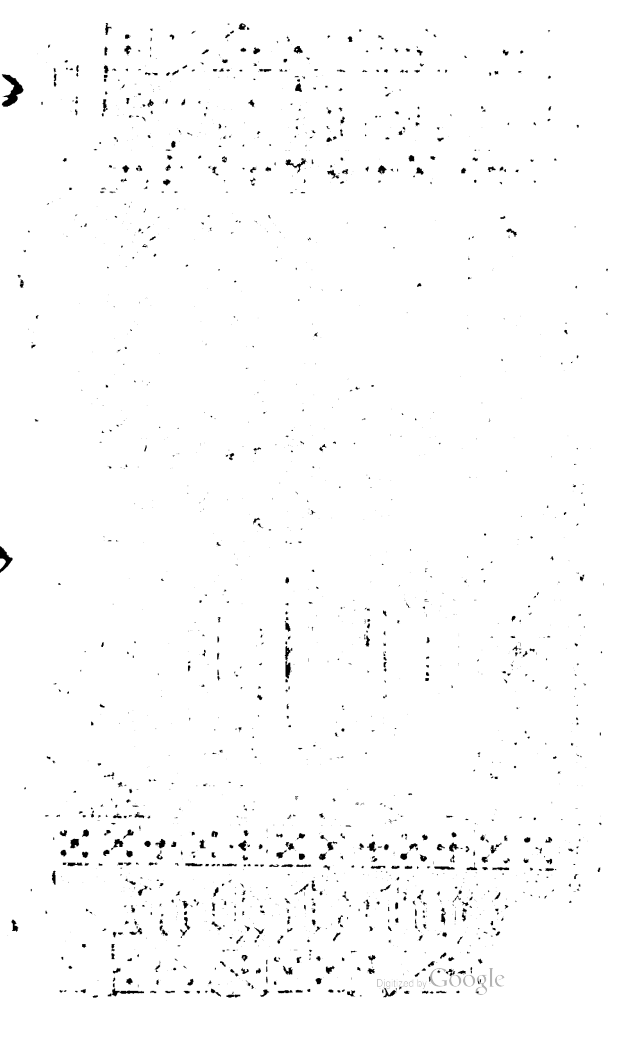
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THE Stepping Stone TO Architecture

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TO

ARCHITECTURE

CONSISTING OF

A SERIES OF QUESTIONS AND ANSWERS

EXPLAINING IN SIMPLE LANGUAGE THE

PRINCIPLES AND PROGRESS OF ARCHITECTURE

FROM THE EARLIEST TIMES.

BY THOMAS MITCHELL.

ILLUSTRATED BY ENGRAVINGS.

LONDON:
LONGMANS, GREEN, AND CO.
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PREFACE.

THIS LITTLE WORK is compiled with the view of creating a taste in the mind of the young for the noblest of the Arts.

It is obviously impossible, in a work of this size, that all detail should be minutely described, or even mentioned; but it is hoped that enough is given to make the learner wish to know more: and if this result follows, the object of the Author will be accomplished.

Thanks are due to the publishers of "Gwilt's Encyclopædia of Architecture" for the loan of the engravings; and acknowledgment is made of the assistance derived from that valuable work, and the articles on Architecture in the "Dictionary of Literature, Science, and Art," in verifying many matters of detail.

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THE STEPPING-STONE TO ARCHITECTURE.

CHAPTER I.

EARLY HISTORY OF ARCHITECTURE.

QUESTION. What is Architecture?

ANSWER. Architecture is the art of constructing a building upon correct and scientific principles, embodying strength, utility, and beauty.

Q. What was the origin of this art?

A. The origin of this art must have been the necessity found by our race in all parts of the world for protection from weather and from the attacks of enemies.

Q. What was probably the first kind of habitation devised or adapted by man?

A. No doubt the first habitations devised by man were bowers in the forests, and from his observance of the habits of inferior animals, caves hollowed out of the earth.

Q. Of what materials is it most probable that the earliest buildings were constructed?

A. It is most probable that the earliest

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materials used were rushes, reeds, and the branches of trees tied together, plastered with mud and thatched with leaves. The ancient Britons constructed most of their dwellings of wickerwork.

Q. What reason have we to suppose that such rude materials were ever used by man in constructing his dwellings?

A. Because such materials were generally ready at hand, and because they are even now used amongst the uncivilised tribes of New Zealand, and the Sandwich Isles.

Q. Of what shape is it most likely that the earliest habitations were made, and why?

A. It is most probable that they were made of a conical shape, because such structures would be most easy of construction and removal, would afford most protection from rain, and would be less likely to be upset by the wind.

Q. Are there any countries in which the conical shape is still in use?

A. Yes; it is seen in the tents of the nomadic tribes of Arabia and Thibet, the huts of the Kamtschatkans, and the wigwams of many tribes of North American Indians, some of which are constructed of bundles of long rushes, the thin ends of which are tied together at the top, and the thick ends spread out, and fastened to each other at the bottom.

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Q. What was probably the next form that suggested itself?

A. As owing to the increase of families larger space was required, this was no doubt obtained by means of large limbs of trees fixed in the ground at the corners of the proposed dwelling, and the intervening spaces filled up with smaller branches, &c.

Q. To what result did the experience thus gained lead?

A. In the first place, to the practicability of still further increasing the accommodation by the addition of another room above the room on the ground, while the advantages derived from the conical habitation no doubt suggested the idea of a sloping roof, though in eastern countries, and in others where there is little rain, this form of roof has never been generally adopted.

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CHAPTER II.

ON ANCIENT AND MEDIÆVAL ARCHITECTURE.

Q. How many styles of architecture are there?

A. There are many styles of architecture, and it would be impossible in this work to describe or enumerate them all, as every country on the face of the globe with any approach to civilisation has its various styles adapted to the exigencies of its climate, the tastes and pursuits of its inhabitants, and the materials for building which they have at their command.

Q. What distinction can you make between Greek and Roman Architecture?

A. The architecture of the Greeks was that of the column and entablature. The genuine architecture of the Romans was that of the arch, though when they conquered the Greeks, they grafted Greek forms on their own style, and so made the latter exhibit a combination of both.

Q. What is the principle of the styles known as Gothic?

A. The Gothic styles may be classified in two broad divisions, the first of which, comprising the styles generally known as the Early English or Lancet, and the Geometrical, or First and Second Pointed Styles, exhibits throughout the principle of *sub-*

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ordination, or *unity of separately existing parts*, while the second division comprising the Curvilinear Decorated, or Continuous, and the Rectilinear, or Perpendicular Styles, tended more and more to *blend* or *fuse* the separate parts. The Romanesque styles which preceded the Gothic may be described as more or less a return to the genuine arched constructions of ancient Rome.

Q. Wherein does the great difference consist in the principle of construction of an ancient and mediæval edifice?

A. In the effect produced by the chief lines in the design. These, in Greek architecture, are the horizontal; in the mediæval styles, they are the vertical.

Q. May not some religious symbolism be the cause of this difference in principle?

A. To some extent perhaps; but it is obvious that when the pointed superseded the round arch, all the buildings would exhibit more and more the vertical character, which results from the combination of the several parts of a design into the whole.

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CHAPTER III.

GENERAL DETAIL OF GRECIAN AND ROMAN ARCHITECTURE.

Q. Give a general idea of what the so-called classic styles include.

A. The classic styles are the various styles founded and practised by the ancient Greeks and Romans. Other styles were developed from these, the principal of which are, the Romanesque or Byzantine, the Italian, including the Florentine, modern Roman and Venetian, and the Renaissance.

Q. Name some of the distinguishing features of Greek and Roman architecture.

A. The column, entablature, and pediment, together with pilasters, colonnades, arcades, and porticoes.

Q. What is a column?

A. A column is a perpendicular erection, of timber, stone, or iron, and is used to support the weight of superincumbent parts of the building. In classic architecture the column with its appurtenances forms the principal distinguishing feature of the different orders.

Q. Describe the different parts of a column.

A. The principal parts are the base, the shaft, and the capital, the base and the capital

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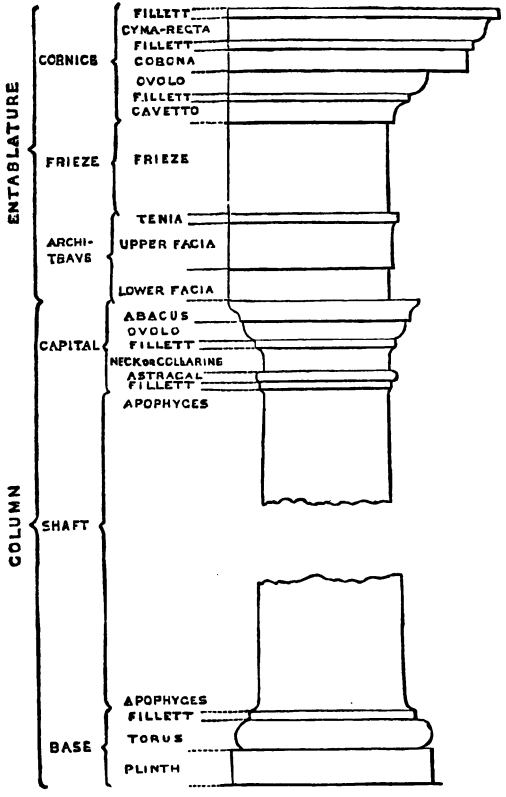
PLATE 1.



SECTION OF COLUMN AND ENTABLATURE.
(Divided according to the Tuscan Order.)

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being subdivided into different parts, each of which had its name and proportion. Indeed, the column is so important a part of classic architecture, that the exact proportions of each part are settled by rule, according to the order used. (Plate 1.)

Q. What is an abacus?

A. A flat slab or tablet forming the upper member of a capital. (Plate 1.) In the Tuscan and Doric orders it is square, but in the other orders it is hollowed out at the sides, and the corners cut off.

Q. What are pilasters?

A. Pilasters are flat square columns attached to a wall, behind a column, or along the side of a building, and projecting from the wall about a fourth or a sixth part of their breadth. The Greeks had a slightly different design for the capitals of pilasters, and made them the same width at top as at bottom, but the Romans gave them the same capitals as the columns, and made them of diminished width at the top, similar to the columns.

Q. What is a colonnade?

A. A colonnade is a range of columns, and a name is usually prefixed to it, signifying the number of columns it contains, and founded on the Greek word for that number.

Q. Give examples of these different names.

A. A colonnade with four columns is called

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tetrastyle; with six columns, hexastyle; with eight columns, octastyle; with ten columns, decastyle, and so on. If the space between the columns is equal to one-and-a-half diameter of the column, it is called pycnostyle; if to two diameters, systyle; if to two-and-a-quarter diameters, eustyle; if to three diameters, diastyle; and if to four diameters, aræostyle.

Fig. 1. Colonnade.

Q. What is a colonnade called when in front of a building?

A. It is then called a portico, and when entirely surrounding the building, peristyle; and when the columns are double or treble in depth, polystyle. (Plate 2.)

Q. What is an arcade?

A. An arcade is a series of arches and pillars either open or attached to the wall, and is, perhaps, one of the most beautiful and

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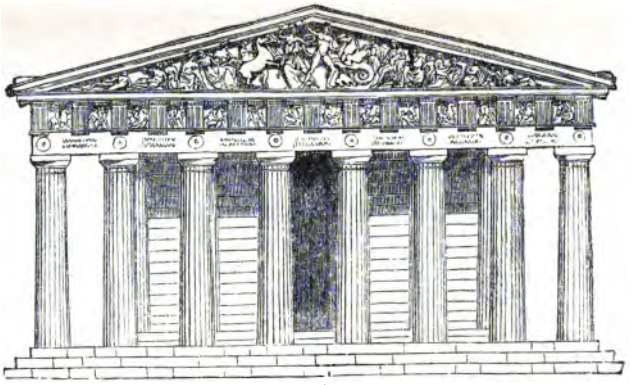

WEST FRONT OF PARTHENON RESTORED.

PLATE 2.

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pleasing combinations which architecture affords.

Q. What are the spaces between the arches in an arcade called?

A. Spandrils, which in mediæval architecture are often carved with a diapered pattern, or decorated with tracery or panelling.

Q. What is the chief use of an arcade?

A. An arcade, when outside a building, is generally used to support a balcony or promenade outside the first floor windows. Arcades also afford shelter from rain and heat; the only real objection to their use, is, that they obstruct the light from the ground floor. They are more frequently used on the continent than in this country.

Q. Describe the entablature.

A. The entablature comprises the whole of the parts between the tops of the columns and the pediment, and consists of the architrave, the frieze, and the cornice. (Plate 1.)

Q. What is the architrave?

A. The architrave (or principal beam as the name implies) is the lowest division of the entablature, resting immediately on the tops of the columns.

Q. What is the frieze?

A. The frieze (or ornamental part) is the division between the architrave and the cornice, and in the ancient Grecian examples was beautifully sculptured. In the Tuscan

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order it is quite plain, as that order is destitute of ornament. In the modern Italian style it is sometimes plain but swelled out, or as it is technically termed cushioned. (Plate 1.)

Fig. 2. Architrave.

Q. How is the frieze ornamented in the Doric order?

A. By triglyphs and metopes. The triglyphs consist of three vertical angular channels or flutes separated by flat spaces, and were generally placed by the Romans over the tops of the columns. Metopes are the spaces between the triglyphs, and originally were left open, and when filled in were quite plain. In Roman buildings they were usually carved with a representation of an ox skull, but sometimes shields and other devices were used. The Romans con-

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sidered it essential that the metope should be an exact square.

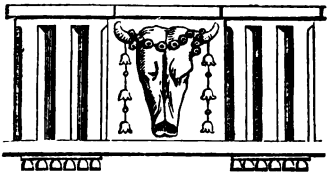

Fig. 3. Metope and Triglyphs.

Q. What is the cornice ?

A The cornice is the horizontal moulding on the top of the frieze, and the division between the cornice and the frieze is generally marked by a row of small square blocks, called dentals, placed at regular intervals of about two-thirds or three-fourths of their breadth. The cornice is varied for each of the orders.

Fig. 4. Cornice.

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Q. What is the pediment?

A. The pediment is the triangular crowning part of a portico, and corresponds with a gable in Gothic architecture, excepting that the angle is much more obtuse than that of a gable. The angle of the pediment corresponds with the slope of the roof. (Plate 2.)

Q. To what other uses are pediments applied?

A. In the modern Italian styles the tops of doorways and windows are often arranged as pediments, which are supported on consoles, trusses, or brackets; and in later examples such pediments are often segmental or circular at top, instead of angular. (Plate 3.)

Q. What are caryatides?

Fig. 5. Caryatides.

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PLATE 3.

ITALIAN WINDOWS COVERED BY PEDIMENTS.

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A. Caryatides are colossal emblematica lfigures, made to do duty as columns, to support porticoes, &c. There is no doubt that, as a means of support, columns would answer the purpose much better, but they were often used by the Greeks when an extra amount of decoration was required. Male figures are called Telamones and Atlantes, or Persians.

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CHAPTER IV.

ON THE ORDERS OF GRECIAN AND ROMAN ARCHITECTURE.

Q. What do you mean by an order?

A. An order, in Grecian and Roman architecture, consists of the column, base, pedestal, capital, frieze, cornice, and moulding belonging to it.

Q. How many orders are there?

A. Five. There are three primary Greek orders, viz.:—

The Doric,
The Ionic, and
The Corinthian.

Two more were added by the Romans, viz.:—

The Tuscan, a modification of the Doric, and
The Composite, a modification of the Corinthian.

Q. Describe the principal features of the Doric order.

A. The Doric order was the oldest and simplest of the three Greek orders. The shafts of the columns are fluted, and the flutings, which are twenty in number, and not quite a semicircle in depth, are separated only by a sharp edge and not by a fillet. As

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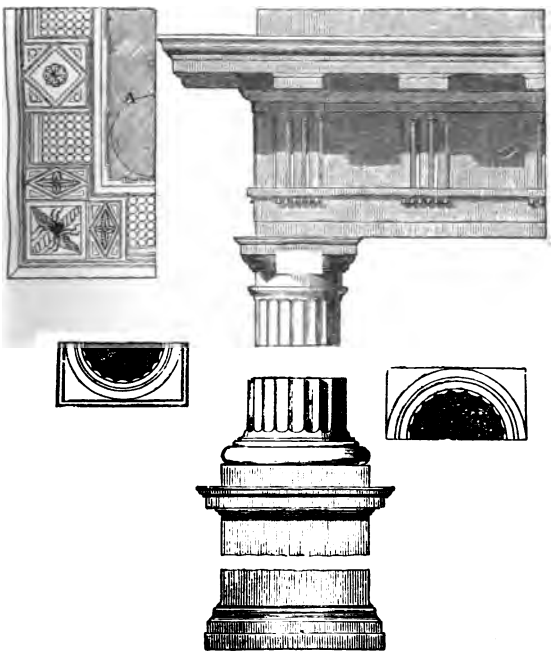
PLATE 4.



DORIC ORDER.

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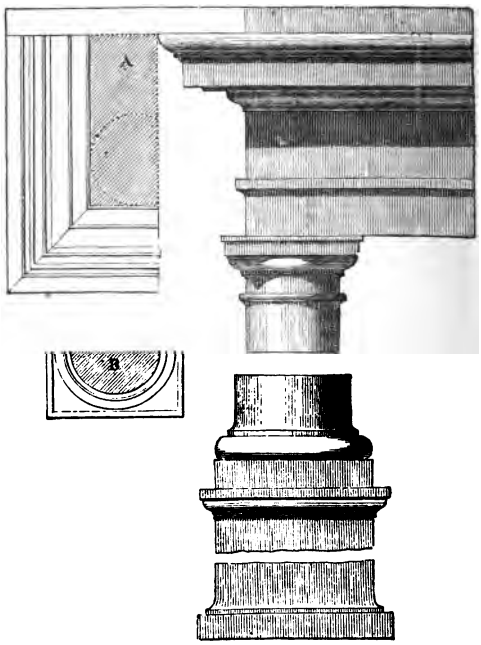
PLATE 5.



TUSCAN ORDER.

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used by the Greeks, this order was without base or pedestal.

Q. What is the proportionate height of a Doric column?

A. The height of a Doric column is usually from seven to eight times its diameter at the bottom.

Q. How is the Doric column surmounted?

A. The Doric column is surmounted by a capital, consisting of a perfectly plain square abacus, with a single line of moulding underneath it, technically termed a quirked ovolo. (Plates 4 and 2.)

Q. Describe the Tuscan order.

A. The Tuscan order, which was founded by the Romans, is a variety of the Doric, and is principally distinguished by its massiveness and strength.

Q. What is the proportionate height of the column, and how is it surmounted?

A. The columns are seldom higher than from five-and-a-half to seven times their diameter at the bottom; they have a simple square abacus and ovolo for a capital, and rest on a massive cubical base, with a torus moulding. The shafts are never fluted. (Plate 5.)

Q. In what position is this order placed in modern erections of more than one storey and where several orders are used?

A. In such a case this order would be used for

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the basement or lower storeys, which would give an air of strength and solidity to the whole.

Q. Describe the Ionic order.

A. This order is the second of the orders adopted by the Greeks, and is of lighter character than either the Doric or the Tuscan. The shafts are generally, though not always, fluted, with a fillet between the flutings.

Q. What is the proportionate height of the Ionic column?

A. The total height of the column ought not to exceed nine times its diameter at the base, including the pedestal, if there is one. As used by the Grecians, this order was without a pedestal, but the Romans added one.

Q. How is the Ionic column surmounted?

A. It is surmounted by a capital, having spiral-shaped scrolls at each side, termed volutes. It has also a moulded base at the bottom, in height about half the diameter of the shaft. (Plate 6.)

Q. Describe the Corinthian order.

A. This order is the lightest and most elegant of the three orders used by the ancient Greeks. The shaft of the column is fluted, and the cornices and mouldings are richer than those of the Ionic or Doric orders.

Q. What is the proportionate height of the Corinthian column?

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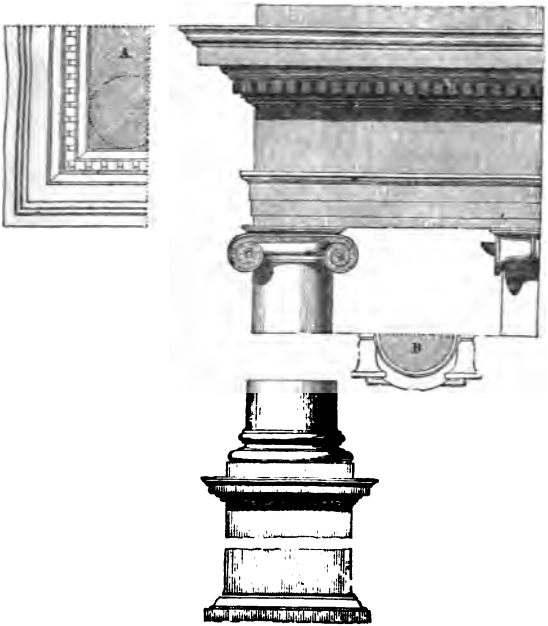
PLATE 6.



IONIC ORDER.

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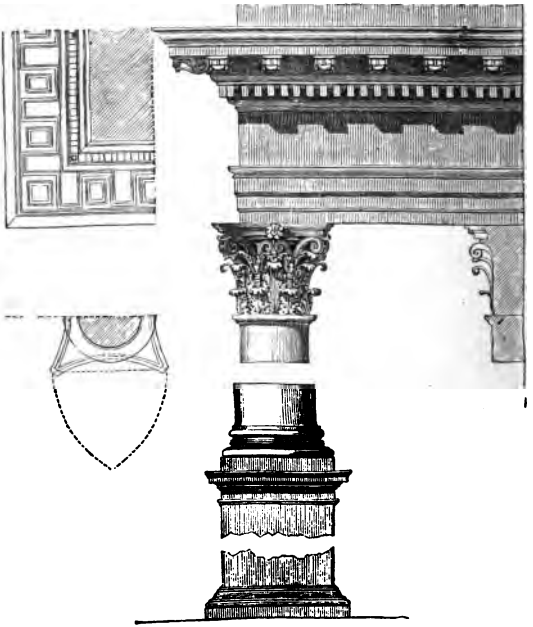
PLATE 7.



CORINTHIAN ORDER.

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CHAPTER V.

ON PLANS, FOUNDATIONS, AND THE CONSTRUCTION OF ARCHES.

Q. What are the first steps generally taken by an architect in the erection of a building?

A. The preparation of plans or drawings showing the design of the building intended to be erected.

Q. How many sets of plans are necessary to convey an accurate idea of the appearance and arrangement of the intended building?

A. Four, viz., the ground plans, the elevations, and the perspective, and sectional plans.

Q. Of what do the ground plans consist?

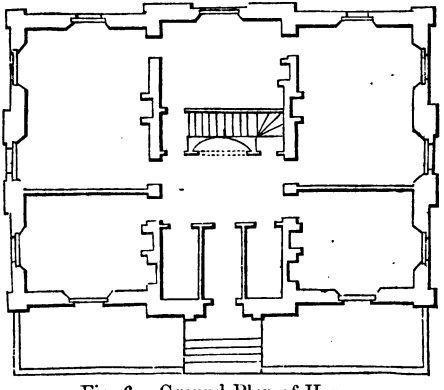

Fig. 6. Ground Plan of House.

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A. The ground plan is a representation of a horizontal section of the intended building, showing the shape of the ground plot whereon it is to be erected, the outlines of the walls and the distribution and extent of the various parts. When necessary this plan is repeated for each floor. In a ground plan the solid parts, such as walls and piers, &c., are shaded or coloured dark to distinguish them from the open parts.

Q. What is meant by the elevations?

A. The elevations are correct drawings of the front and sides of the proposed building, showing its height and proportions.

Q. What is the perspective drawing?

A. A representation of the intended building as viewed from a given point showing the general effect of its appearance.

Q. What are the sectional drawings?

A. Drawings representing a perpendicular section of the building cut in two from the top to the bottom, showing the internal arrangements of floors, staircases, chimneys, &c.

Q. What are the next steps to be taken in the erection of a building?

A. The preparation of the foundations, which must be of sufficient firmness to ensure that there shall be no settlement or sinking of the building at any part.

Q. When the ground is not naturally firm enough to ensure the stability of the building, how is this remedied?

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A. Artificial foundations are prepared of concrete. A trench is dug about twice the width of the thickness of the wall at the foundation, and of a depth in proportion to the height of the building or as the ground is more or less to be trusted, and is filled with a mixture of shingle or small loose stones, lime, and Portland cement. This mixture, which is dropped into the trench from some height, speedily sets, and becomes almost as hard as solid rock.

Q. Are the walls then raised on this foundation?

A. Yes, and they should be twice as thick for the basement as for the rest of the building. In fact the remainder of the wall is sometimes slightly reduced in thickness for each succeeding storey.

Q. When openings are required in the basement walls, how are they constructed so as not to diminish their strength?

A. In such cases inverted arches are used, and the opening above is covered by means of an ordinary arch or iron girder.

Q. Explain the principle of the inverted arch.

A. Inverted arches are used to prevent the weight of the superstructure pressing the piers into the earth at any point, which might occur owing to their not being sufficiently broad in surface at the bottom. The inverted arches distribute the weight

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along the whole length of the foundation wall.

Fig. 7. Inverted Arches.

Q. What is an arch?

A. An arch is a curved structure, open below and closed above, and when properly constructed is supported by the pressure of its component parts.

Q. In what style of ancient architecture was the arch systematically employed?

A. In that of the ancient Romans, by whom it was used both for engineering and ornamental purposes, but it enters most largely as a constructive principle into the mediæval styles.

Q. Was not the arch used by the ancient Greeks?

A. No. They seem to have been unacquainted with the principle of the arch,—all their doorways, windows, and spaces between columns being on the principle of the architrave.

Q. How do you account for the absence of the arch in Greek architecture and its frequent use in Roman?

A. The reason is apparent when the natural features of the different countries are considered. In Greece there are few or no

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rivers,—in fact they can hardly be called more than rivulets or streams,—and the means of crossing them were simple; but in Italy the width of the rivers necessitated the use of arched bridges.

Q. Name some of the uses of the arch.

A. The arch is most frequently used when there is weight to be supported and open spaces are needed below, for instance, in bridges, viaducts, and the walls of churches, between the nave and aisles.

Q. Give an example of the use of the arch by the ancient Romans.

A. The ancient Romans employed the arch in their viaducts or artificial roads, in their bridges, and in their aqueducts, and, for ornamental purposes, chiefly in their triumphal arches, which were erected to honour the return of their victorious generals and to celebrate their triumphs.

Fig. 8. Triumphal Arch.

Q. Describe the construction of an arch.

A. An arch is composed of voussoirs or wedge-

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shaped pieces of stone or brick, and the lines formed by the interstices between the voussoirs all point to the centres of the arch, or to the centre of the segments of arcs which form the arch, as will be clearly seen from the diagrams. The outer line is called the extrados, and the inner line the intrados.

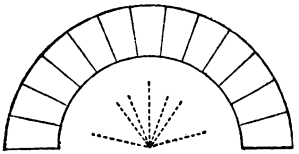

Fig. 9. Round Arch.

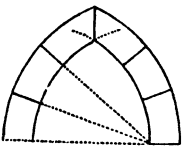

Fig. 10. Equilateral Arch.

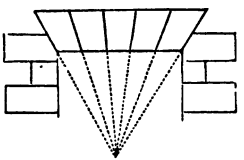

Fig. 11. Flat Arch.

Q. What are the abutments of an arch ?

A. The abutments are the solid piers at the sides of the arch, and it is obvious that these must be sufficiently strong to bear the thrust of the arch.

Q. How is an arch measured ?

A. The distance between the piers is called the

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span of the arch; and from the level line of the springing to the point or top of the arch, is its height.

Q. Are there not other modes of shaping the voussoirs?

A. Yes; but they are only variations of the principle already explained, and are perhaps resorted to more for ornament than for additional strength; the principle is the same in each case, as will be seen by the diagrams. In fig. 12, six of the voussoirs have crossettes or elbows, overlapping the adjoining stone, which give them a horizontal as well as central bearing; in fig. 13, the voussoirs are cut to fit into each other, or in technical phrase joggled.

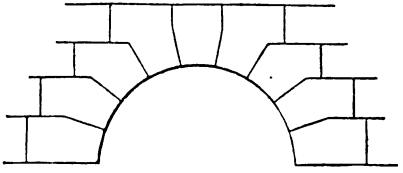

Fig. 12. Round Arch with crossettes.

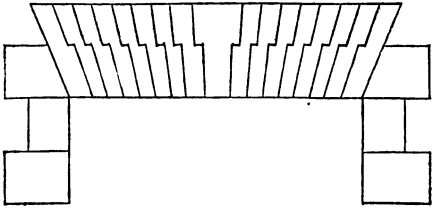

Fig. 13. Flat Arch, joggled.

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Q What is the name of the uppermost or middle voussoir?

A. The key-stone; it is generally larger than the other voussoirs, and it is so named because it forms, as it were, a key to bind the whole arch firmly together.

Q. Is the arch capable of supporting much weight?

A. Yes. If the arch is properly constructed it is capable of supporting an equal, if not a greater weight, than a solid wall.

Q. Is this the case with brickwork without any masonry?

A. Decidedly. If the bricks are gauged to the proper shape, and the arch rightly constructed, with a double or treble course of bricks to form the arch, it will, after the wall has been carried up a little way, be as capable of supporting as much weight as if there were no opening.

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CHAPTER VI.

GENERAL DETAIL OF MEDIÆVAL ARCHITECTURE.

Section I.—Ecclesiastical.

Fig. 14. Tarragona Cathedral.

Q. Name some of the chief features peculiar to mediæval or Gothic architecture.

A. Arches, pillars, buttresses, towers, spires, and pinnacles, traceried windows, and high pitched roofs.

Q. How many different kinds of arches are there, and name them?

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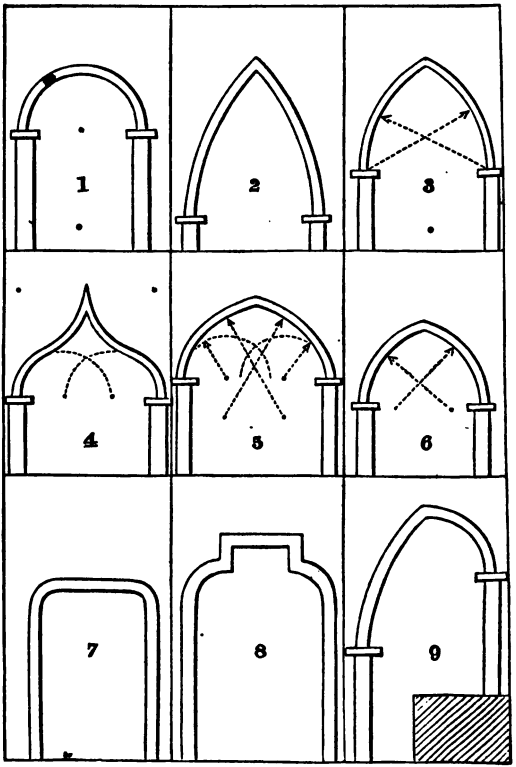
PLATE 9.



DIFFERENT SHAPED ARCHES.

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A. Nine, viz.:—

1. Semicircular, used in the Roman, Saxon and Norman styles, but rarely met with in the Gothic.
2. The lancet or sharp-pointed, belonging to the Early English period.
3. Equilateral } belonging to the Geometrical and Curvilinear Decorated periods.
4. Ogee }
5. Four-centred, belonging to the Perpendicular period.
6. Drop }
7. Straight and } used in the various transitional periods.
8. Shouldered }
9. Rampant, used in either style for staircases.

There are some variations of these occasionally met with, for instance, the horseshoe in the Moorish and the stilted arch in the Norman, the three and five-centred in the Perpendicular period, and the flat arch; but those enumerated above are the principal. (Plate 9.)

Q. What is the difference between a Gothic pillar and a classic column?

A. The Gothic pillar is generally clustered, giving an appearance of several small pillars united together, and often consists of a large central shaft with four smaller shafts surrounding it. A common form of pillar consists of a square with rectangular recesses at each of the corners, a circular shaft in each of the recesses, and a semi-

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circular one on two or on each of the faces. In the decorated period a lozenge-shaped pillar is often met with, beautifully carved.

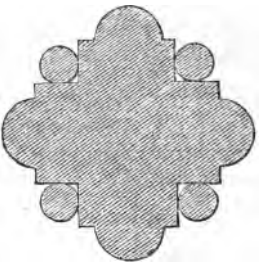

Fig. 15. Ground plan of Pillar.

Q. What kind of capitals and bases are used for a Gothic pillar?

A. The bases are generally moulded, the capitals also sometimes consist of a series of mouldings, but as the style was developed, and as more decoration was used, they are richly carved with foliage and flowers copied from nature, oak leaves ivy leaves, and the leaves of the whitethorn, hazel, and marsh mallow, being often met with.

Fig. 16. Capital of Column.

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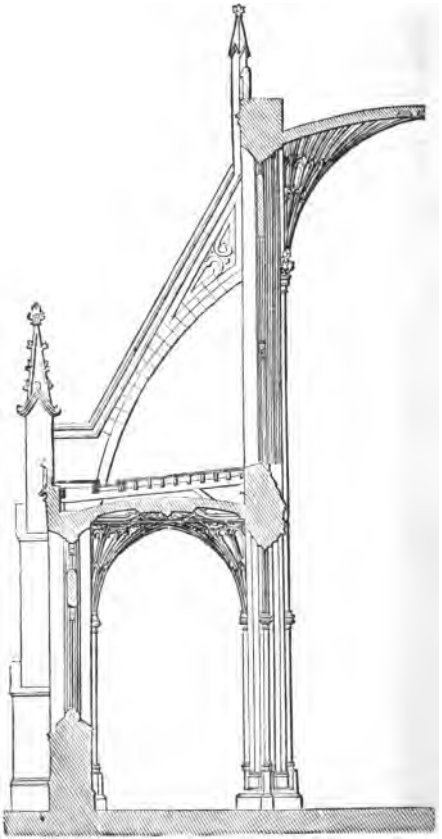
PLATE 10.



Bath Abbey.

FLYING BUTTRESS.

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Q. What is a buttress?

A. A buttress is a mass of masonry or brick-work, built on the outside of a wall to give it additional strength to resist the strain of the roof, &c.

Q. Are the buttresses alike in all the English styles?

A. They are on the same principle, but vary according to the period. The Early English buttresses stand out very boldly, and are generally broken into two or three stages, and reduced in thickness at each stage. In the Decorated examples they are also divided into stages, and ornamented with niches and canopies to contain figures. In the Perpendicular period they are but slightly different, excepting that they are more often ornamented with the pannelling peculiar to that style. They are often surmounted by pinnacles.

Q. What are flying buttresses?

A. Flying buttresses are arched buttresses, used when extra strength is required for the upper part of the wall of the nave, &c., to resist the outward thrust of a vaulted ceiling; the lower part of the flying buttress generally rests upon the buttress of the outside wall of the aisles. Such buttresses are most common in the great continental churches; but some beautiful specimens can be seen at Westminster Abbey, Wells Cathedral, Bath Abbey Church, and St. Mary Redcliffe, Bristol. (Plate 10.)

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Q. What is a tower?

A. A tower is a lofty square structure of several storeys, and strengthened by buttresses. The object of a tower is to give dignity to a building, and also to contain a peal of bells, which are placed in an upper chamber of the tower, called a belfry. (Plate 11, Fig. 2.)

Q. Mention some of the best examples of towers in this country.

A. The towers of Gloucester Cathedral, York Minster, Beverley Minster, Canterbury and Lincoln Cathedrals, and Magdalen College, Oxford, are, perhaps, the finest amongst the many noble towers in this country.

Q. What counties in England are celebrated for the fine towers to their parish churches?

A. Somersetshire, Lincolnshire, and Norfolk, which possess a very large number of magnificent towers, any one of which might well be the pride of a whole county.

Q. What is a spire?

A. A spire is a lofty structure built on the top of a low tower, and tapering gradually to a point at the top. (Plate 11, Fig. 2.)

Q. Of what shape is the tapering part?

A. The tapering part is generally octagonal, and the angles are often crocketed, i.e. ornamented with carved figures like leaves curling over. There are often little windows or niches, and canopies made at in-

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PLATE 11.

Fig. 1.—*Heckington.*

SPIRE.

Fig. 2.—*All Saints', Derby.*

TOWER.

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tervals. The name of steeple is often applied to either a tower or a spire, or to the combination of both.

Q. Mention some of the finest spires in this country?

A. The spires of Salisbury and Norwich Cathedrals, and St. Michael's Church, Coventry.

Q. What are pinnacles?

A. Pinnacles are small spires used to ornament the tops of buttresses, gables, &c.

Q. What are turrets?

A. Turrets are little towers which are used to ornament different parts of Gothic buildings; frequently the high towers of churches and cathedrals are finished off by turrets or pinnacles at the corners.

Q. Are not towers and spires used in classic buildings?

A. They were not used in any ancient exemples, but modern buildings often have steeples, and the idea is evidently taken from the Gothic, though not with very great success. The best specimens are those by Sir Christopher Wren. St. Mary-le-Bow, Cheapside, Christchurch, Newgate Street, and St. Michael-le-Querne, Foster Lane, are perhaps the three best examples that can be mentioned, though there are many copied from them.

Q. What is tracery?

A. Tracery is the ornamental stonework in the

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head of windows forming geometrical and flowing patterns, or caused by the intersection and combination of mullions. (Plates 12, 13, 14, and 15.)

Q. What are mullions?

A. Mullions are the upright divisions of the stonework, dividing the window into compartments or lights. (Plates 12 and 14.)

Q. What was the origin of mullions and tracery?

A. No doubt the first idea of mullions and tracery was obtained by the combination of two or more narrow windows of the Early English period.

Q. How many kinds of tracery are there?

A. Two: plate tracery and bar tracery.

Q. What is plate tracery?

A. Plate tracery is the very earliest form of tracery, and belongs to the later periods of the First Pointed, or Early English style. It consists simply of apertures cut in the flat surface of the stonework between the tops of the narrow windows.

Q. Is this, properly speaking, tracery?

A. No; the complete idea of Gothic tracery requires, not only that the lights and figure (or figures) above them shall be combined by label and arch, with mullions instead of portions of wall, but that the spandrils in the window-head shall be pierced.

Q. What is bar tracery?

A. Bar tracery is the most elaborate form of

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PLATE 12.

Fig. 1.—Merton College, Oxford.

Fig. 2.—Oxford Cathedral.

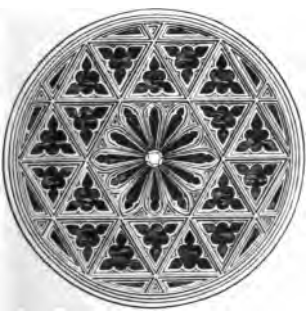

Fig. 3.—Winchester Palace, Southwark.

GEOMETRICAL POINTED, CURVILINEAR POINTED, AND GEOMETRICAL CIRCULAR WINDOWS.

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PLATE 13.

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

GEOMETRICAL FIGURES USED IN TRACERY AND PANELLING.

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this kind of ornament, and belongs chiefly to the Geometrical and Curvilinear Decorated periods. Its name is derived from the supposed resemblance to bars of iron twisted and bent to form geometrical and floriated patterns. Many most beautiful examples are to be found in York Minster.

Q. Is the use of tracery confined to windows?

A. No; it is also used in panelling and in open screen work of wood or stone.

Q. What are transoms?

A. Transoms are the horizontal divisions across the mullions, and are used in the windows of the Continuous or Perpendicular period, which are occasionally of great size; indeed the tracery of windows of this period very often partakes more of the character of open panelling, filled in with glass, than is consistent with a true Gothic effect, and this is one of the later features of the period marking the decline of the style.

Q. What other feature exists in the windows, panelling, and screens of Gothic architecture?

A. The little arches formed by the mullions are often cusped, that is, there are projections from the curve of the arch, as though another arch was going to spring out. These cusps, in the Perpendicular style, are often decorated by a flower at the point. Two cusps in the arch form a trefoil, three a quatrefoil, and so on.

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Q. What other shapes do windows assume in Gothic architecture?

A. The wheel or rose, and the squarehead.

Q. Describe these.

A. The wheel or rose window is circular and is filled with tracery like shafts, radiating from the centre, resembling the spokes of a wheel, as in Westminister Abbey, or in waving lines, as in the Flamboyant buildings of France (Plate 15). The square-topped window used only in the Perpendicular style, is divided by mullions and transoms. (Plate 14, fig. 2.)

Q. What is meant by the hood moulding?

A. The hood moulding (also called the drip-stone) is a projecting moulding over the tops of traceried windows and doorways. It seldom extends lower than the spring of the arch, and is used for the double purpose of ornament and to protect the tracery from the rain. Perpendicular windows and doorways are almost invariably hooded.

Q. Describe the construction of a roof.

A. The principal parts are the rafters, trusses, posts, purlins, and braces. Their forms and uses are shown in the diagrams. It will be observed that the object of the tiebeam is to prevent the sloping rafters from spreading out. The king-post stands on the tiebeam, and reaches up to the ridge-piece, which it supports, and the braces or

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PLATE 14.

Fig. 1.—Aylsham.

Fig. 2.—Norwich.

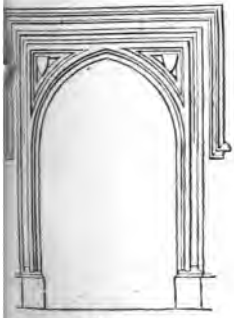

Fig. 3.—Tattershall Castle.

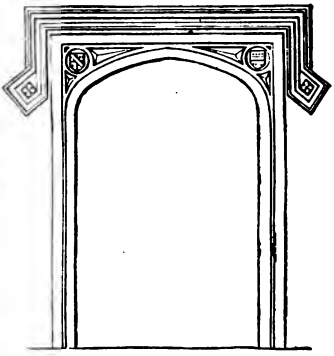

Fig. 4.—S. George's Chapel.

PERPENDICULAR WINDOWS AND DOORWAYS.

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PLATE 15.

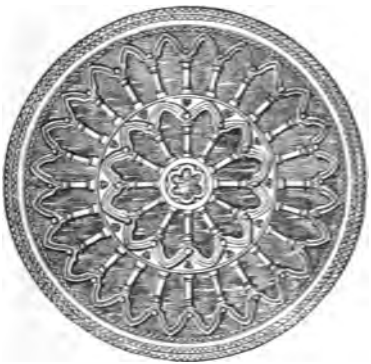

Fig. 1.—*York.*

WHEEL WINDOW.

Fig. 2.—*S. Ouen, Rouen.*

FLAMBOYANT ROSE WINDOW.

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struts reach from the foot of the king-post to the middle of the sloping rafters, preventing them from bending in or bulging out, and the purlins are horizontal rafters, running along the sloping rafters at the top of the braces. Sometimes there are two posts on the tiebeam, in which case it is called a queen-post roof (see cuts).

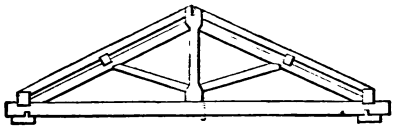

Fig. 17. King Post Roof.

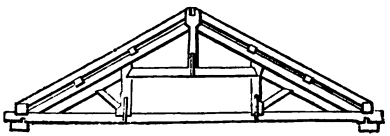

Fig. 18. Queen Post Roof.

Q. What is meant by a high-pitched roof?

A. Gothic roofs of the Early English and Decorated periods are often of a high pitch, i.e. the sides and base of the roof form an equilateral triangle, the insides being open so that the woodwork is visible. In the Perpendicular period the roofs were more depressed, that is, the angle at the top was more obtuse, which marks another sign in the decline of the true Gothic principle.

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Q. What material was used for covering the roof?

A. Shingles or thin slabs of oak, which however gave way to tiles, and ultimately to lead, as being more durable.

Q. What were the means used for conducting the water from the roof?

A. The water was collected by a gutter, and discharged from the roof by spouts called gurgoyles, which were frequently carved into a representation of a grotesque figure, which threw the water from its mouth.

Q. What are corbels?

A. Corbels are projecting pieces of timber or stone set in a wall for an arch to spring from, or to support the beam.

Q. What is a gable?

A. A gable is the upper part of the end wall of a building above the eaves and conforming to the angle of the roof.

Q. What is a vaulted roof?

A. A vaulted roof, or, more properly, a vaulted ceiling, as there is always an additional outside roof to cover it, is built on the principle of the arch, and is often richly groined and ornamented with bosses and pendants. In some mediæval buildings, probably owing to the walls not being of sufficient strength to bear the weight of stone, blocks of wood have been used instead, and made to look like stone.

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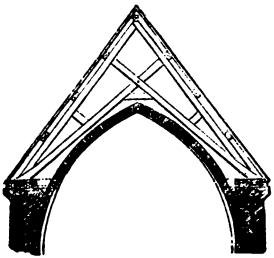

Fig. 19. Vaulted Ceiling.

Q. What is a groined ceiling?

A. Most vaulted ceilings are groined, the groins being the angles formed by the intersection of the arches. In many cases they are rendered more prominent by being ribbed or moulded, a boss or ornament being generally placed where all the ribs meet at the top.

Q. What other ways are there of ornamenting the ceiling?

A. In the Perpendicular style there is a kind of tracery leading from the pillars and spreading all over the vaulted ceiling. This is called fan tracery. There are also in this style some beautiful examples of flat ceilings divided into panels, the divisions of which are richly moulded and ornamented with bosses.

Q. What is a pendant?

A. A pendant is a hanging ornament, sometimes

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of large size, and often covered with moulding or sculpture. It is placed at the conjunction of the fan tracery, or of the ribs

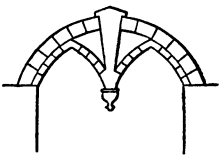

Fig. 20. Pendant.

at the top of the vaulted roof. The way in which it is supported is shewn in the diagram. Pendants are principally used in the Perpendicular style, and there are some beautiful specimens in Henry VII.'s chapel.

Q. How is a Gothic church divided ?

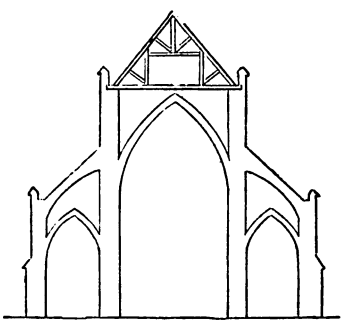

Fig. 21. Nave and Aisles.

A. Into nave and aisles, choir, and chancel.

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The nave and aisles are for the congregation, the choir for the singers, and the chancel for the celebration of Holy Communion. This arrangement is that which is generally adopted in cathedrals and minsters, but it is not universal, as many small parish churches have no aisle or choir, but simply consist of nave and chancel.

Q. What is a lady chapel?

A. A small chapel attached to collegiate and other large churches, dedicated to the Blessed Virgin and often forming a projection from the main building, generally to the eastward of the chancel.

Q. Are these divisions all under the same roof?

A. No. The nave is divided from the aisles by arches and pillars, and has a roof to itself; the roofs of the aisles are not nearly so high as the nave, and the roof of the choir and chancel is generally either higher or lower than the nave.

Q. What are clerestory windows?

A. The clerestory, or clear-story, is the name of a series of windows which are often seen over the arches which divide the nave from the aisles, and are so called because they form a clear story above the other parts of the building, and to distinguish it from the triforium, which was called the blind story. They are useful to increase the light in the nave. (Fig. 24, page 65.)

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Q. What is the triforium?

A. The triforium, sometimes called the *blind story*, is a gallery with small open arches in front built over the aisles, sometimes in the thickness of the wall, and often between the vaulted ceiling of the aisles and the outside roofs. (Fig. 24, page 65.)

Q. What is a porch?

A. A porch is a roofed structure outside the principal doorways, and most usually in height only just covers the doorway, though in some examples there is a room over them. In the debased or Elizabethan style, porches are sometimes carried up as high as the rest of the building and with uniform stories.

Q. What is a canopy?

A. A canopy is a projecting ornamented covering over doors, windows, and niches for receiving statues, &c. They were used in all the Gothic styles, though chiefly in the Perpendicular.

Q. What is meant by tesselated pavement? and by whom was it originally used?

A. Tesselated pavement is composed of pieces of different coloured marble or tiles arranged to form geometrical patterns. The Romans often used baked tiles also, which were coloured and shaped to form patterns. Many remains of these have been exhumed recently, among which may be mentioned a very fine specimen recently found at

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Canterbury, and now deposited in Canterbury Museum. Tesselated pavements were largely used by mediæval architects.

Q. Did the ancient and mediæval architects employ the aid of colour in their buildings?

A. Yes. Colour was largely employed by both in the way of colouring the walls by means of frescoes, &c., and in drapery, as well as in painted windows. Much of the bareness and coldness noticed in some mediæval remains is no doubt caused by the absence of drapery and tapestry hangings, intended to be used by the architect, but which have not been replaced.

Q. What great lesson may be learnt from a survey of the remains of both ancient and mediæval buildings besides their style and form of architecture?

A. That ancient architects worked throughout on principle, employing in their construction only such forms as were necessary. We seldom find in the remains of their buildings anything made of plaster while purporting to be of stone, or any inscriptions painted while purporting to be incised. Nearly everything is what it seems to be. If Greeks and Romans had erected their buildings as many large modern buildings are erected, we should have but few models from which to take pattern. Evidently their buildings were meant to

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last, and each stone was laid with the intention that their children in a remote age might find it as perfect as they left it. Their motto was not 'this is the cheapest and easiest way to do it, and at any rate it will last our time.' The remains of our mediæval buildings, many of which were brought to their present state by sieges and fires, and battering of warlike engines, commonly exhibit some glorious piece of masonry still practically uninjured, and we can thus form some conception of what the whole must have been when just completed by those master builders.

Section II.

Fig. 22. Conway Castle.

On Military and Domestic Architecture.

[Although many of the features just described are used both in ecclesiastical and military or domestic architec-

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ture, the following are used only in the latter, and it is therefore deemed best to describe them in a separate section.]

Q. What was the character of the domestic architecture of the ancient Greeks?

A. Very poor; their entire attention was paid to their temples.

Q. Was this the case with the ancient Romans?

A. No. The ancient Romans paid greater attention to civil and domestic architecture, as the remains of their triumphal arches, amphitheatres, baths, and houses testify.

Q. What was the Basilica of the ancient Romans?

A. Basilica was the name given to the public Hall of Justice; it generally contained an altar for the administration of oaths, and a raised platform for the judges. Many of these basilicas were afterwards converted into Christian churches.

Q. What buildings next to the ecclesiastical structures received the greatest amount of attention from the mediæval architects?

A. The castles of the barons and nobility.

Q. What is a castle?

A. An edifice of great strength and solidity, being a fortress and palace combined. They were used as dwelling-places by the nobility, and were strongly fortified so as to be able to withstand the attack of an invading force.

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Q. What are the general characteristics of a Gothic castle?

A. Convenience was evidently sacrificed for security, the apartments were often gloomy, bed-chambers few and small, passages narrow and intricate, and the stairs steep and dark.

Q. What was the general plan of defence?

A. They were surrounded in most instances by a moat or deep ditch, which was generally kept filled with water so as to render it difficult for the attacking party to get near enough to make a breach in the walls.

Q. What were the means of exit and entrance to the inhabitants of the castle?

A. A drawbridge or platform which could be lowered or raised when necessary.

Q. Supposing the drawbridge was inadvertently left down, what was the defence of the doorway?

A. A portcullis, which was a kind of crossbarred gate of great strength, sliding in grooves, which was kept lowered in front of the principal entrance.

Q. Describe the principal entrance to a castle?

A. The principal entrance was often very imposing, consisting of a long passage with a vaulted ceiling and portcullis at either end, and capable of resisting a prolonged attack.

Q. What was the next defence to the castle?

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A. The barbican, which was a kind of tower often separated from the castle and strongly fortified to guard the drawbridge and principal entrance.

Q. What was the principal tower called ?

A. The keep.

Q. What is a parapet ?

A. A low wall to afford protection to soldiers fighting on the ramparts of castles and the roofs of other buildings.

Q. What is an alur ?

A. A hidden passage behind a parapet for the purpose of watching unseen the operations of besiegers.

Q. What are battlements ?

A. Notched or indented parapets. The solid parts are called merlons, and the openings embrasures, or crenelles, through which archers could shoot. Battlements are sometimes employed for ornament in ecclesiastical structures.

Q. What is a bartizan ?

A. A small overhanging turret projecting from the corners of a tower or from the parapet. They are more commonly used on the continent than in this country.

Q. What was the chief apartment in a mediæval castle ?

A. The hall, where all meals were had, and which was often strewed with rushes for the servants to sleep on at night.

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Q. What is a bay or oriel window?

A. Bay windows were chiefly used in the Perpendicular style, and formed a bay or recess at the upper end of the hall. These recesses were either rectangular or polygonal, and when used for an upper storey were supported on the outside by corbels, or a projecting series of mouldings. Bay windows or bow windows of a semicircular shape are often used in the modern Italian styles.

Q. What was the next important apartment in the castle?

A. The kitchen, which on account of the number of retainers and frequent visitors at the castle of a baron, formed a most important feature. It was sometimes a separate building, but was most usually in direct communication with the hall.

Q. What was the postern gate?

A. A private or concealed gate in a castle or monastery by which means of exit was obtained or message sent for aid during a siege.

Q. What are cloisters?

A. A covered arcade on three sides of a quadrangular space in front of a church or monastery; they were used as places of study by the monks, and the space inclosed within them was used for recreation.

Q. What were the lavatories?

A. Places for washing in monastic buildings, sometimes consisting of a fountain or re-

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servoir of water and a stone trough in the cloisters.

Q. What is a lantern tower ?

A. A small turret usually erected on the roof of a hall, or at the junction of a transept; they were open to view from the ground nearly the whole of their height. The name was also applied to an open erection on the tops of towers, as at Boston Church, Lincolnshire.

Q. What are dormer windows?

A. They are small windows built out of a high-pitched roof ; they are very picturesque in appearance, and are so called because they were originally used for dormitories, or sleeping-chambers.

Q. What is the meaning of the term 'batter ?'

A. Walls leaning inwards are said to batter, that is, the top part of the building would be of less circumference than the base. Walls of wharves, embankments, and fortifications generally batter.

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CHAPTER VII.

ON THE DEVELOPMENT AND DISTINGUISHING FEATURES OF SUCCEEDING STYLES FROM THE ANCIENT GRECIAN TO THE ROMANESQUE.

Q. What different races would be likely to have used the primitive forms of habitation you have mentioned—viz., the cave, the tent, and the hut?

A. The cave hollowed out of the earth would be most likely to be used by those races who adopted hunting and fishing for their pursuits, and would not have much time for mechanical occupation. The tent was used by these engaged in pastoral duties, on account of the frequent removals necessitated by changing pasture for their flocks; and the hut was no doubt used by those who were engaged in agricultural occupation, and required a permanent dwelling near the scene of their labours.

Q. What styles of architecture are most likely developed from these original sources?

A. The architecture of India, Assyria, and Egypt was no doubt derived from caves and excavations; that of China, &c. from the tent; while that of Greece and Rome was derived from the wooden hut.

Q. Explain very briefly the grounds for assum-

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ing that the excavated cave was the model for Egyptian and Indian architecture.

A. The remains which exist at the present day of the Indian rock-cut temples, and the similarity between these and their edifices above ground, go far to prove the theory as regards India, while the massiveness and the converging walls of Egyptian architecture give rise to a similar belief.

Q. Explain, in a similar manner, the reason for believing the tent to have been the model of Chinese architecture.

A. The principal proof is the form of the roofs, which nothing but a tent could have suggested, and the extreme lightness of appearance which characterises the style.

Q. Why may it be believed that the principle of Grecian architecture was derived from the wooden hut?

A. The chief features of Grecian architecture already enumerated, all give evidence of their having been copied in stone from what were originally timber structures; and perhaps it will be well to enumerate each portion separately.

Q. What was the origin of the column?

A. Trunks of trees driven into the ground to support a covering for shelter, were the origin of the columns used to support the porticoes of temples, &c., which became one of the chief features of the style. As the trees were wider in diameter at the bottom

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than at the top, so the columns were made to diminish in thickness as they rose.

Q. What was the origin of the capitals and bases?

A. The first step in the formation of an architectural capital was no doubt a flat slab of stone, tile, or wood, placed on the top of the column to give it a larger surface to receive the architrave. The Doric capital consists simply of this square slab or abacus, with an echinus and annule, or ring, below it, and it has been suggested that the bases were added to raise the columns from the earth to prevent rot from dampness. It must however be remembered that the Doric, the earliest of the Grecian orders, had no base. (Plate 2.)

Q. What was the origin of the fillets at top and bottom of the shafts?

A. The column being originally of wood, no doubt had ties or rings of iron at top and bottom to prevent the wood from splitting, and these were afterwards imitated in the stone column.

Q. What was the origin of the architrave?

A. The architrave, as its name implies, was the chief beam of wood laid horizontally on the tops of the columns, and was intended to support the covering of the entire building.

Q. What was the origin of the frieze?

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A. The joists of the ceiling rested on the architrave, and the space occupied by their height was the origin of the frieze, the ends of the joists being ornamented with triglyphs, and the open spaces between the joists formed the metopes, which were afterwards filled in solid.

Q. What was the origin of the pediment?

A. The inclined rafters of the roof projected beyond the face of the building, and the angle formed by the pitch of the roof gave the form of the pediment.

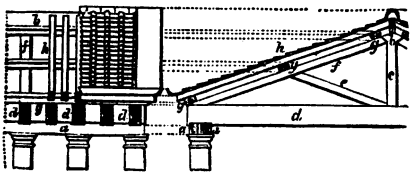

Fig. 23. Roof.

Q. Explain the different parts of this cut.

A. *aa.* The architraves.
bb. The ridge piece or columen.
c. The king post or columna of a roof.
dd. The tiebeam or transtrum.
e. The strut or capreolus.
ff. The rafters or cantherii.
gg. The purlines or templa.
hh. The common rafters or asseres.

Q. Which of the three Grecian orders gives most encouragement to the theory of the wooden model?

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A. The Doric, which was the most ancient, from its severe simplicity gives great weight to the theory of its having been founded upon a translation into stone of previous wooden structures.

Q. What was the next step in the advancement of Grecian architecture?

A. The Ionic order, which appears to have sacrificed a certain amount of solidity to the attainment of elegance and finish, and to have lost a great many of the characteristics of the wooden model.

Q. About what period was this?

A. About the time of Alexander the Great, at a period when there was a general outburst of talent both for sculpture and architecture throughout Greece.

Q. What was the next advance made in the art?

A. The Corinthian order, which exhibits still further the progress of the art. The beautiful capital of acanthus leaves, the elegant frieze, and the costly marbles used in its construction, combined to make this the most elegant and delicate of the three Grecian orders.

Q. Are the remains of Grecian workmanship numerous?

A. No; unfortunately they are very scarce; and it is conjectured that owing to the value of the materials employed, many of

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the most splendid buildings were taken down by the Romans after their conquest of the country and re-erected in Rome to increase the glories of their own capital.

Q. What put a stop to the further development of Grecian architecture?

A. The entire subjugation of that country by the Romans.

Q. To whom must we now look for the further development of the art?

A. To the Romans, who, though they had a style of their own, founded on the principle of the arch, acknowledged the intellectual superiority of the Greeks, and submitted to their teaching in the matters of art; and much that was thoroughly good in their own style was disguised or concealed by Greek decoration.

Q. Did the Romans go the proper way to work to develop their own style of architecture?

A. No, they sacrificed their own superior constructive genius, which, if strictly adhered to and properly developed, might in their hands have produced the most stupendous results, for the sake of a foreign ornamentation which, however beautiful, was entirely unsuited to their peculiar principle of construction, the Greek capital and entablature being thoroughly antagonistic to the principal feature of pure Roman work.

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Q. What was the constructive principle of pure Roman work?

A. The real principle of ancient Roman architecture was that of the *Arch*, and the remains of their buildings where Grecian decoration was abstained from, prove that they were constructed with a massiveness and strength which has rarely been equalled since.

Q. What was probably the origin of the arch?

A. It is not improbable that the first idea of the arch was suggested by the inclined struts which were often used in timber structures to lessen the strain on a beam, and which were placed from the sides of the columns to the underside of the beam. But in truth, the theories which profess to account for the origin of this form of construction are almost endless.

Q. What was the character of Roman workmanship?

A. The detail of Roman workmanship was more meretricious in effect and possessed greater richness than the Grecian, but was destitute of the chaste simplicity, sublimity and grandeur of the Grecian model.

Q. What was the first symptom of decay in Roman architecture?

A. The abandonment of columns from their natural and legitimate use as a means of support, and their employment merely for

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ornament, in many instances being half imbedded in the walls.

Q. What was the immediate cause of the decline of Grecian and Roman architecture?

A. The overthrow of the Roman power by the northern races of Europe, who stripped the temples &c. of all the gorgeous decorations with which they were adorned, and so revealed the genuine principle of construction, which became in their hands the germ of a style which when fully developed contained in it all that was beautiful and grand.

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CHAPTER VIII.

ON THE ROMANESQUE STYLES.

Q. What was the next step towards the development of a new style and the disuse of the ancient?

A. The transition period from the Roman style to the succeeding one was marked by the abandonment of the use of the Grecian entablature above the columns, and the use of arches of a semicircular form for window and other openings which sprung immediately from the imposts of the columns.

Q. What was the name given to the architecture which succeeded that of Rome?

A. The Romanesque.

Q. What particular styles of architecture are included in the Romanesque?

A. The term Romanesque embraces all those styles of architecture which prevailed between the destruction of the Roman Empire and the use of the vertical Mediæval style, and in it may be included the Saxon, Norman, and Lombard styles.

Q. What are the chief characteristics?

A. They partake much of the character of the debased Roman style, which accounts for the name of Romanesque. The style is also called Byzantine from its introduction

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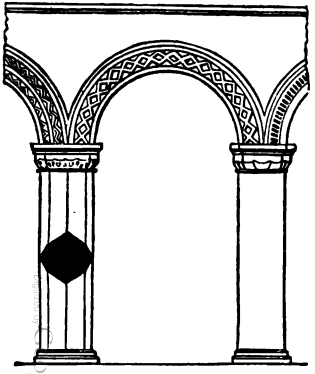

Fig. 1.—*Ely.*

SAXON ARCH AND PILLARS.

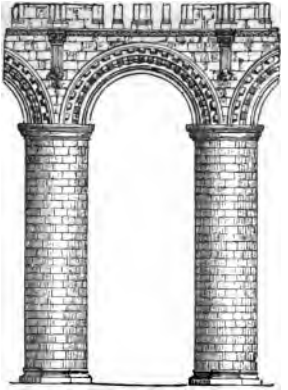

Fig. 2.—*Gloucester.*

NORMAN ARCH AND PILLARS.

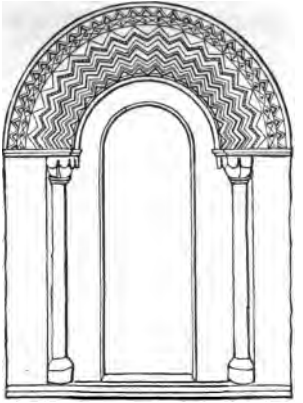

Fig. 3.—*Beaudesert.*

NORMAN WINDOW.

PLATE 16.

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at Byzantium. This style may be considered as the progenitor of the Mediæval styles, as in it may be found the germ of many features which were afterwards developed and brought to perfection in them.

Q. What peculiar kind of roof is often introduced in Romanesque or Byzantine buildings?

A. The cupola, which is a kind of dome, and constructed on the principle of the arch.

Q. What model did the Romanesque builders employ in their erection of the early Christian churches?

A. The earliest Christian churches appear to have been built upon a model of the Roman Basilica or Hall of Justice, which was divided down the middle by rows of columns forming aisles, and in many cases had a semicircular recess at the end, no doubt suggesting the idea of the apsidal termination to the chancel, noticeable in the remains of many Saxon and Norman churches.

Q. Describe the Saxon style?

A. The Saxon style was that species of Romanesque which was in use in this country before the Norman was introduced. It was of simple character, and no doubt the greater portion of the churches, &c. were of wood, the existing remains exhibiting evidence of their having been copied in

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stone from previous wooden models. The round arch was used and occasionally the pillars were octagonal. The remains of Saxon workmanship in our old parish churches are very numerous, but they are of a very fragmentary character. (Plate 16, fig. 1.)

Q. What was the Norman style?

A. The Norman style was that species of Romanesque which was practised by the Normans, and which was introduced and fully developed in this country after they had established themselves in it.

Q. Describe the chief features of the Norman style.

A. Plainness and massiveness are the chief characteristics of the earlier examples. The arches, windows, and doorways were semicircular. The pillars are very massive, and are often built up of small stones laid like brick-work. (Plate 16, fig. 2.)

Q. Are the later examples as plain as the earlier?

A. No; as the style progressed the ornamentation was more elaborate, and in later examples the arches, doorways, and windows are most richly moulded (Plate 16, fig. 3), and often sculptured with grotesque figures. Many beautiful examples of Norman art remain, e.g. parts of Peterborough, Ely, Norwich, Hereford, and Gloucester

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Cathedrals, and the Chapel of St. Cross, Winchester.

Q. What other feature do the later specimens of Norman work present?

A. The elevation of the interior, and the division into the triple range of pier arch, triforium, and clerestory. This is a great advance towards the pure Gothic principle, but it is as yet only partial, as the horizontal lines between each remained unbroken.

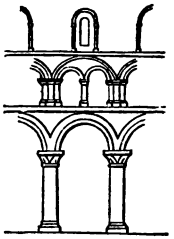

Fig. 24. Romanesque.

Q. What further advance was required to develop fully the Gothic principle?

A. The transitional progress of the Norman style from a Romanesque to a Gothic character was further marked by the introduction of small vertical shafts running up the piers to the roof, dividing the triforium and clerestory into parts. The effect of the horizontal division into layers of the Romanesque style is now gone, and the

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vertical principle of Gothic architecture begins to establish itself. In many later examples of Norman work, the departure from the Romanesque principle is so great as to remove them entirely from the Romanesque class to the Gothic.

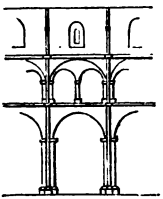

Fig. 25. Transition Romanesque.

Q. What other change was now necessary to establish fully the principle of Gothic architecture?

A. The universal adoption of the pointed arch, in place of the semicircular, was alone needed to establish fully the principle of verticality, which is one of the principal characteristics of pure Gothic architecture.

Q. Were the Normans good builders?

A. It can hardly be said that they were good builders, for notwithstanding the massiveness of their works they appear to have been careless with their foundations, often commencing new work upon the foundations of old buildings. Very many of their towers have fallen from this cause, and the fact of our having so many remains of

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their work may be attributed to the immense masses of stone employed in their masonry, rather than to the skill with which they are laid.

Q. What is the Lombard style?

A. The Lombard style was that species of Romanesque which was in use on some parts of the Continent during the periods when the Saxon and Norman styles were in use in this country, and corresponded with them in its development into the Continental Gothic.

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CHAPTER IX.

ON THE DEVELOPMENT OF MEDIÆVAL ARCHITECTURE.

Q. What is meant by the term Gothic?

A. The name of Gothic was given to the various Mediæval styles at a period in the sixteenth century when a great classic revival was going on, and everything not classic was considered barbarian or Gothic. The term was thus originally intended as one of stigma, and although it conveys a false idea of the character of the Mediæval styles, it has been long used to distinguish them from the Grecian and Roman.

Q. What change was produced by the general adoption of the pointed arch?

A. The true principle of Gothic architecture was firmly established.

Q. What is the true principle of Gothic architecture?

A. The vertical division, relation, and subordination of the different parts, distinct and yet at unity with each other, and while this principle was adhered to, Gothic architecture may be said to have retained its vitality.

Q. Describe the distinguishing features of the earlier stage of Gothic architecture.

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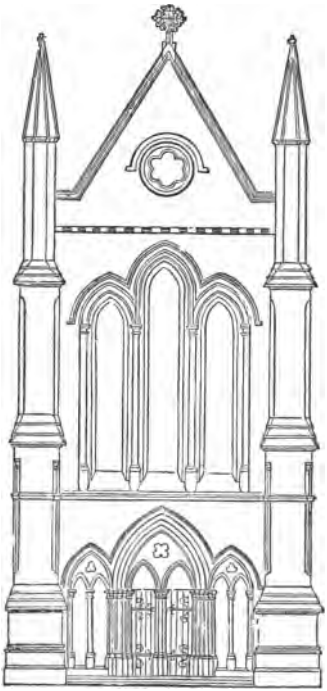

Fig. 26. Early English Façade.

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A. The chief features of the earliest periods are high-pitched roofs, sharp-pointed arches, and narrow windows, and a more severe treatment generally than is apparent in succeeding styles. Lincoln and Salisbury Cathedrals and Westminster Abbey are among the most beautiful examples of this period, which has been designated as the Early English, First Pointed, or Lancet, on account of the sharp-pointed arches. (Plate 17, fig. 1.)

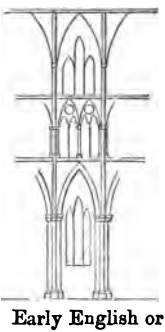

Fig. 27. Early English or Lancet.

Q. What further progress was made in Gothic architecture at this period, and to what did it give rise?

A. The grouping together of two or more windows and enclosing them with an arch. The spaces between the tops of the windows were then pierced, which gave rise to the adoption of plate tracery, which at first

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PLATE 17.

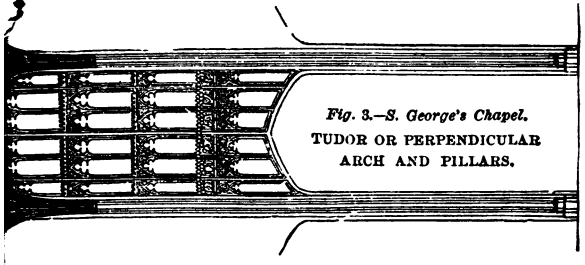

Fig. 3.—*S. George's Chapel.*
TUDOR OR PERPENDICULAR
ARCH AND PILLARS.

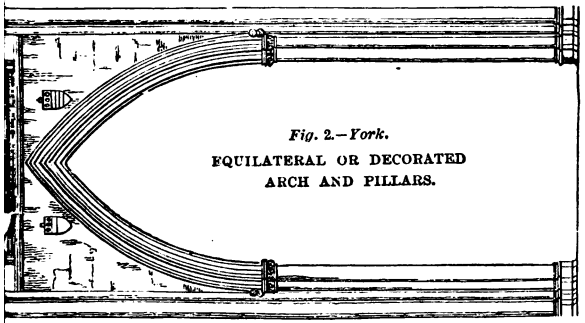

Fig. 2.—*York.*
EQUILATERAL OR DECORATED
ARCH AND PILLARS.

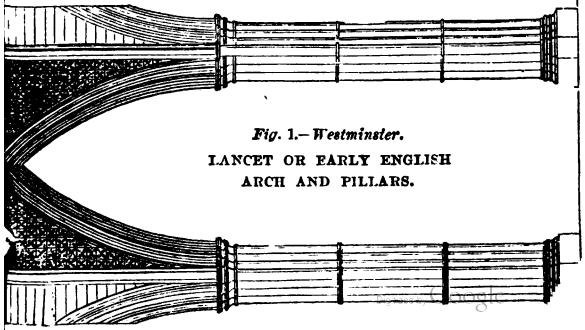

Fig. 1.—*Westminster.*
LANCET OR EARLY ENGLISH
ARCH AND PILLARS.

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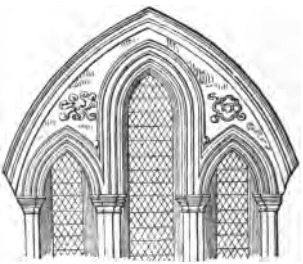
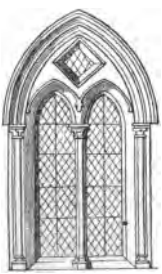
PLATE 18.

Canterbury.

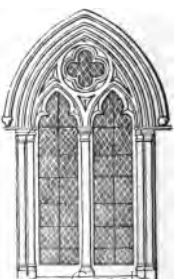
Lincoln.



Salisbury.



Chamber, Westminster.



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EARLY ENGLISH WINDOWS.

consisted only of the openings made in the walls between the tops of the windows. The upright pieces of wall between the windows became narrower and ultimately gave way to mullions, and the two or more windows grouped together became one window, consisting of two or more lights. (Plate 18.)

Fig. 28.

Fig. 29.

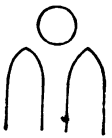

Fig. 30.

Fig. 31.

Fig. 32.

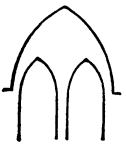

Fig. 33.

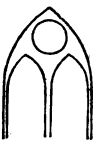

Fig. 34.

Fig. 35.

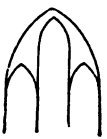

Fig. 36.

Q. What were the next changes introduced into Gothic architecture?

A. The principal changes next made were such

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as further developed the principle of subordination, viz. the widening of the arches

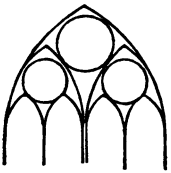
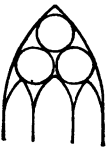


Fig. 37.



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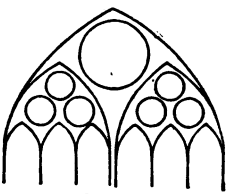

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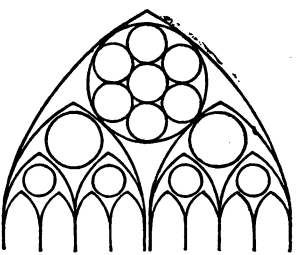

Fig. 40.

and the general adoption of the equilateral form (Plate 17, fig. 2); the use of bar

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tracery instead of plate tracery, the patterns being worked in geometrical forms; the clustering of shafts and the exquisite mouldings round the arches, doors and windows. (Plate 12, fig. 1.)

Q. What name has been given to the style now adopted?

A. This style has been called the Geometrical Decorated, or Second Pointed, and during

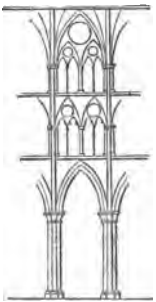

Fig. 41. Geometrical Decorated.

this period Gothic architecture may be considered to be in its prime, for whatever may be the beauty of succeeding styles—and the question of beauty is quite distinct from that of principle—the departure from the true Gothic principle becomes more and more apparent.

Q. Did these changes take place suddenly or rapidly?

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A. No. The change was very gradual, and many examples exist which partake of the character of both the Lancet and Geometrical Decorated styles. Many buildings were erected exhibiting some of the new features before they were universally adopted, and many buildings retained some of the features of the former period after they had passed out of general use. These are called transitional.

Q. Is not this mixture of styles a great hindrance to the assignment of exact dates to mediæval buildings?

A. Yes; but the development of the art rendered necessary a period of transition between each stage, and we are indebted to such periods for some of the most beautiful designs.

Q. Give some examples of the Geometrical Decorated style.

A. Parts of Ely, Exeter, Norwich, York, and Lichfield Cathedrals contain exquisite specimens of the workmanship of this period.

Q. What was the next change in principle?

A. The next change was one which ultimately resulted in the downfall of Gothic architecture; and this was the introduction into the tracery of windows, of curved forms, blending one into the other, instead of the pure geometrical forms which preserved a separate character, while existing in per-

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fect unity (Plate 12, fig. 2). This style, which commences the second division of Gothic architecture, has been called the Curvilinear or Flowing Decorated, and corresponds with the Flamboyant style of France.

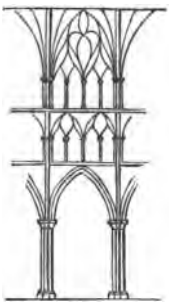

Fig. 42. Curvilinear, Flowing or Late Decorated.

Q. Describe the Flamboyant style of architecture.

A. The Flamboyant style was contemporary in France with the Curvilinear and Continuous styles of this country. This name was given to it from the resemblance of its tracery to the waving of flames. The Church of St. Ouen, Rouen, and the Cathedral of Harfleur in Normandy, contain beautiful specimens of this style.

Q. How did this change lead to the downfall of Gothic architecture?

A. Because it involved a departure from the

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true Gothic principle, the unity of separately existing parts, and allowed the flow-

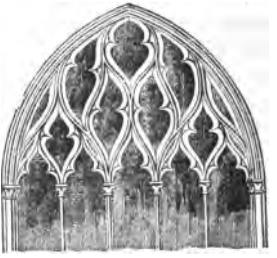

Fig. 43. Flamboyant Window (also see Plate 15, fig. 2).

ing of one form into another, thereby acting upon a new principle—viz. the absorption or blending together of different parts.

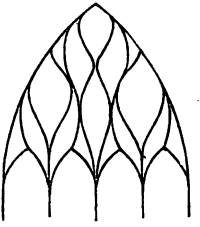

Fig. 44. Flowing Tracery.

Q. Describe the next stage of Gothic architecture.

A. In this stage the principle of continuity is carried out to its greatest extent, the

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capitals of columns become smaller, and ultimately are disused altogether; string courses and bands are more seldom seen, and the perpendicular lines are carried up to the top of the building, until they are finally lost in the fan-tracery of the vaulting. This style has been designated the Tudor, Rectilinear, Continuous, or Perpendicular style.

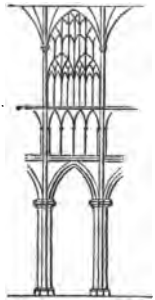

Fig. 45. Continuous or Perpendicular.

Q. What is the shape of the arches in this style ?

A. Pointed, but much depressed (Plate 17, fig. 3). This style is remarkable for the introduction and use of the four-centred arch, which is used for both pier arches, doors, and windows, but which gets more and more depressed, until both doors and windows are made with square tops. (Plate 14, figs. 2, 3, and 4.)

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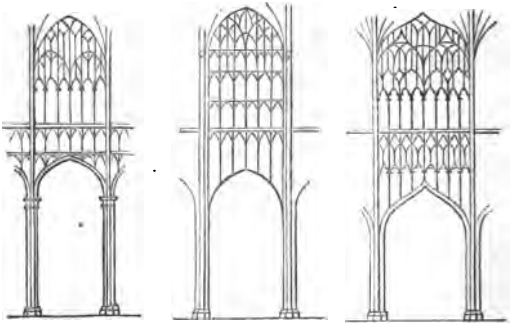

Figs. 46, 47, and 48. Debased Perpendicular.

Q. Describe the window tracery of this period.

A. The perpendicular principle of this style is further carried out by extension of the mullions up to the tops of the windows in place of the flowing tracery of the preceding style. The immense size of some of the windows necessitated the use of transoms to support the mullions.

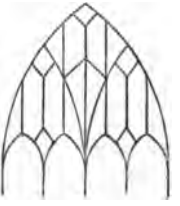

Fig. 49. Continuous Window Head.

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Q. What were the other characteristics of this period?

A. The abundant use of panelling both for doors and walls, which partakes largely of the character of the window tracery. The mouldings are not quite so rich as those of the preceding styles, but the excess of ornament generally is so great as to obtain for this style the designation of 'Florid.'

Q. Name some examples which may be considered as specimens of this style.

A. Many very beautiful specimens are in existence, e.g. Henry VII.'s Chapel at Westminster, parts of Gloucester Cathedral, Winchester College and Cathedral, St. Michael's, Coventry, and Trinity Church, Stratford-upon-Avon.

Q. What was the style of architecture in use in this country in the sixteenth century?

A. It was termed Debased, or Elizabethan, and answers to the Renaissance of the French, being a curious mixture of the Perpendicular style with the Grecian and Roman architecture which was then being revived. It is remarkable how few churches were erected during this period, but many very beautiful country mansions belonging to this time are still in existence.

Q. What is the meaning of the term Renaissance?

A. The Renaissance is the name given by the

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French to the style which was developed in their country in the sixteenth century from a revival of classic detail, which was mixed up with French Gothic.

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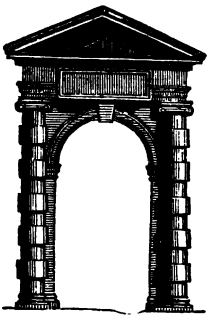
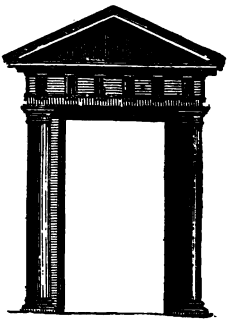
PLATE 19.





ITALIAN WINDOWS AND DOORWAYS.

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CHAPTER X.

ON THE MODERN STYLES OF ARCHITECTURE.

Q. What course was adopted by architects on the decline of Gothic architecture?

A. They tried to adapt the ancient Grecian and Roman styles to modern requirements, an attempt which resulted in the production of what is now termed the Italian style.

Q. Describe the Italian style.

A. The Italian, which embraces the Florentine, modern Roman, and Venetian schools, may be considered as an adaptation of the Greek and Roman orders. (Plate 19.)

Q. What are the chief features of the Florentine style?

A. The Florentine, a variety of the Italian style, is characterised by the absence of columns on the outside, and by the massive cornices with which the buildings are crowned. This style has rather a heavy appearance. The Pandolfini Palace at Florence is a very good example. (Plate 20.)

Q. Describe the chief features of the modern Roman style?

A. The buildings of this style present a most imposing appearance, which is not marred by the too great severity of the Florentine school, and the use of columns in the façades renders them more light and

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pleasing. The Farnese Palace at Rome is a beautiful example of this style. The churches at Rome built in this style are characterised by an excessive amount of ornament. (Plate 21.)

Q. What special feature is introduced in the style known as the Venetian?

A. The use of rustic work for the basement and ground floors, which consist in the front edges of the stones being bevelled or moulded, so that there is a space of 1½ or 2 inches round each stone on the face. The Pompei Palace at Verona, and the Church of St. Mark at Venice are beautiful specimens of this style. (Plate 22.)

Q. What is a Mezzanine?

A. A low intermediate storey which is sometimes made in the Italian styles, to run between two storeys of greater height.

Q. Give the names of two celebrated architects who introduced the Italian style into this country with great success, with examples of their works?

A. Inigo Jones, who designed the banqueting house at Whitehall, and Sir Christopher Wren, who designed St. Paul's Cathedral, St. Stephen's Walbrook, and nearly all the other churches in the City of London which were rebuilt after the great fire.

Q. What is the present style of architecture?

A. There is no style of architecture that can

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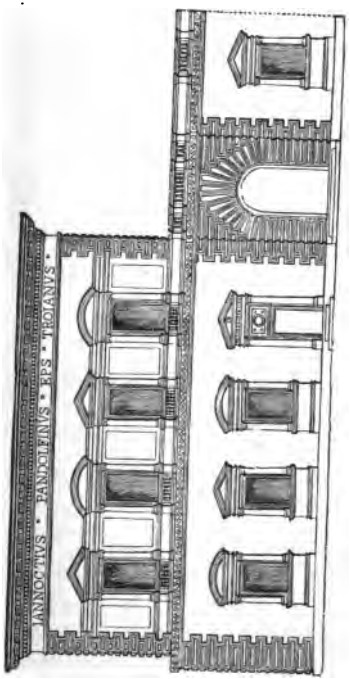
PLATE 20.



PANDULFINI PALACE.

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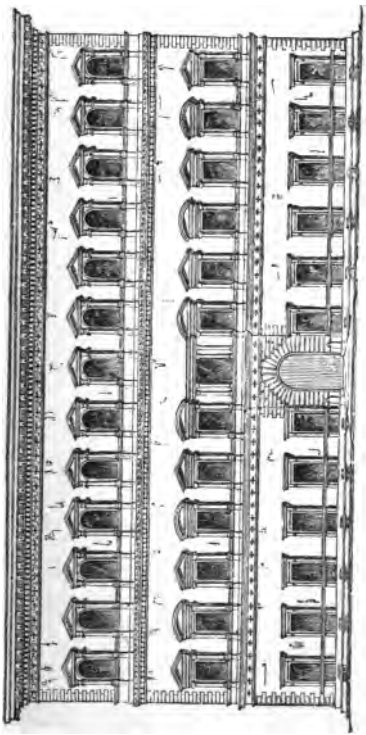
PLATE 21.



FARNESE PALACE.

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PLATE 22.

POMPEI PALACE, VERONA.

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strictly speaking be called that of the present period. The architecture of the present day is chiefly copied or modified from the ancient and mediæval styles; and architects seem to hope that by strictly adhering to the genuine principles of both, a new style may gradually be developed.

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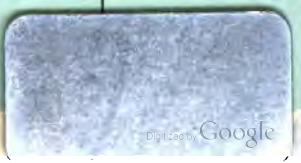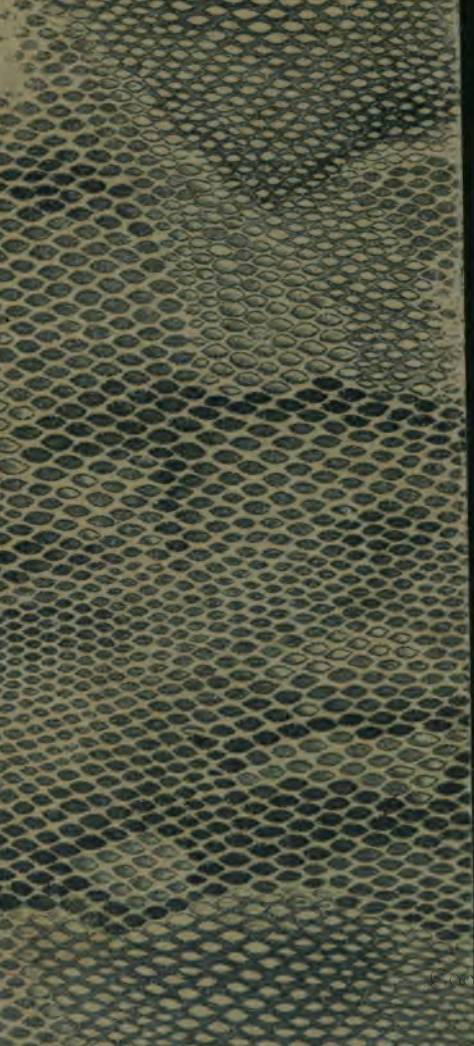
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